

WHAT IS CLAIMED IS:

- 1 1. A speed change gear for an automatic transmission, comprising:
 - 2 1) an input portion for inputting an input rotation from a power source;
 - 3 2) an output portion disposed substantially coaxially with the input portion and
4 outputting an output rotation of the speed change gear; and
 - 5 3) a plurality of planetary gear sets including a compound planetary gear set, the
6 plurality of the planetary gear sets providing a plurality of power conductive paths to an
7 area defined between the input portion and the output portion, the plurality of the
8 planetary gear sets comprising;
9 a clutch and a brake to be selectively connected and disconnected in such a
10 manner that the plurality of the planetary gear sets change a rotation from the input portion
11 at a corresponding gear change ratio by selecting one of the plurality of the power
12 conductive paths, thereby outputting the thus changed rotation to the output portion, the
13 clutch and the brake making a combination of engagement and disengagement, the
14 combination making a selection from at least six forward gears and one reverse gear,
15 one of the plurality of the planetary gear sets being a speed reduction planetary gear
16 set for continuously reducing the input rotation and outputting the thus reduced rotation,
17 the clutch comprising;
18 two clutches including a first clutch and a second clutch for connecting and
19 disconnecting the reduced rotation from the speed reduction planetary gear set to the
20 compound planetary gear set, and
21 a third clutch which is a direct clutch for outputting the input rotation at a
22 constant speed to the compound planetary gear set, the third clutch being disposed radially
23 outward relative to a first ring gear of the speed reduction planetary gear set, the first ring
24 gear having an outer periphery which is provided with a clutch hub, the clutch hub
25 constituting the direct clutch and being an input member to the third clutch.
- 1 2. The speed change gear for the automatic transmission as claimed in claim 1, wherein
2 the speed reduction planetary gear set includes:
 - 3 a first pinion meshing with the first ring gear,
 - 4 a first sun gear meshing with the first pinion, and

5 a first planetary carrier for carrying the first pinion in such a manner that the
6 first pinion rotates, and
7 the speed reduction planetary gear set is a single pinion planetary gear set having the
8 first ring gear as a rotation input member and the first planetary carrier as a rotation output
9 member.

1 3. The speed change gear for the automatic transmission as claimed in claim 1, wherein
2 the speed change gear has the two clutches including the first clutch and the second
3 clutch for connecting and disconnecting the reduced rotation from the speed reduction
4 planetary gear set to the compound planetary gear set, and
5 the clutch hub of the direct clutch and the first ring gear of the speed reduction
6 planetary gear set are so disposed as to define an overlapping at least partly in an axial
7 direction.

1 4. The speed change gear for the automatic transmission as claimed in claim 1, wherein
2 the compound planetary gear set and the two clutches including the first clutch and
3 the second clutch are disposed on a side opposite to the input portion with respect to the
4 speed reduction planetary gear set.

1 5. The speed change gear for the automatic transmission as claimed in claim 1, wherein
2 the clutch hub of the direct clutch and the first ring gear of the speed reduction
3 planetary gear set are substantially the same in material.

1 6. The speed change gear for the automatic transmission as claimed in claim 1, wherein
2 the brake includes a first brake and a second brake,
3 engaging the first clutch and the first brake brings about a first gear,
4 engaging the first clutch and the second brake brings about a second gear,
5 engaging the first clutch and the second clutch brings about a third gear,
6 engaging the first clutch and the third clutch brings about a fourth gear,
7 engaging the second clutch and the third clutch brings about a fifth gear,
8 engaging the third clutch and the second brake brings about a sixth gear, and
9 engaging the second clutch and the first brake brings about the reverse gear.

1 7. The speed change gear for the automatic transmission as claimed in claim 1, wherein
2
3 the speed reduction planetary gear set is a double pinion planetary gear set having a
4 first planetary carrier as a rotation input member and the first ring gear as a rotation output
5 member.

1 8. A speed change gear for an automatic transmission, comprising:
2 1) an input portion for inputting a rotation from a power source;
3 2) an output portion disposed substantially coaxially with the input portion;
4 3) three planetary gear sets including a first planetary gear set, a second planetary
5 gear set and a third planetary gear set for providing a plurality of power conductive paths
6 to an area defined between the input portion and the output portion; and
7 4) a first clutch, a second clutch, a third clutch, a first brake and a second brake to
8 be selectively connected and disconnected in such a manner that the three planetary gear
9 sets change a rotation from the input portion at a corresponding gear change ratio by
10 selecting one of the plurality of the power conductive paths, thereby outputting the thus
11 changed rotation to the output portion, the first clutch, the second clutch, the third clutch,
12 the first brake and the second brake making a combination of engagement and
13 disengagement, the combination making a selection from at least six forward gears and
14 one reverse gear,
15 one of the three planetary gear sets being a speed reduction planetary gear set for
16 continuously reducing the inputted rotation and outputting the thus reduced rotation,
17 one of the remaining two planetary gear sets of the three planetary gear sets being a
18 double sun gear planetary gear set which includes;
19 two sun gears, a common pinion meshing with the two sun gears in common,
20 one ring gear meshing with the common pinion, and a planetary carrier for carrying the
21 common pinion in such a manner that the common pinion rotates, the planetary carrier
22 being adapted to input and output a rotation from the two sun gears via a center member,
23 the other of the remaining two planetary gear sets of the three planetary gear sets
24 being a single pinion planetary gear set which includes;

25 one sun gear, a pinion meshing with the one sun gear, one ring gear meshing
26 with the pinion, and a planetary carrier for carrying the pinion in such a manner that the
27 pinion rotates,
28 wherein,
29 the first clutch and the second clutch connect and disconnect the reduced rotation
30 from the speed reduction planetary gear set to the remaining two planetary gear sets, and
31 the third clutch which is a direct clutch outputting the input rotation at a constant
32 speed to the remaining two planetary gear sets is disposed radially outward relative to a
33 first ring gear of the speed reduction planetary gear set, the first ring gear having an outer
34 periphery which is provided with a clutch hub, the clutch hub constituting the direct clutch
35 and being an input member to the third clutch.